The American STATISTICIAN

The news publication of the
AMERICAN STATISTICAL ASSOCIATION

FEBRUARY, 1954
Volume 8, No. 1

35 CENTS

AMERICAN STATISTICAL ASSOCIATION

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American Statistical Association

Founded 1839

The Editorial Committee welcomes the submission of manuscripts for possible publication. Two copies, double-spaced, should be sent to the Editor, Almarin Phillips, E-140 Dietrich Hall, University of Pennsylvania, Philadelphia 4.

News and notes should be sent to Dana Barbour, News Editor, American Statistical Association, 1108 16th Street, N.W., Washington 6, D. C.

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Proposed Amendment to the By-Laws on Election of Fellows

At the Meeting of the Incoming Board and Council held on Tuesday, December 29, in Washington, D. C., the following motion was passed by the Council:

"The number of new fellows elected in any one year is not to exceed thirty."

This motion is a change from the Constitution, which states, "New fellows shall not be elected if their election will cause the total number of fellows to exceed 250." Thus the motion is in the form of a proposed amendment to the By-Laws of the Constitution. As such, the following Article from the By-Laws is pertinent:

ARTICLE VII—AMENDMENTS TO BY-LAWS

1. *Proposal.* Amendments to the By-Laws may be proposed by the Board of Directors or by a petition signed by 25 members. An amendment originating originating by petition shall be referred to the Board for its recommendations as to ratification.

2. *Ratification.* Following action by the Board, the Secretary-Treasurer shall publish a copy of the proposed amendment and the Board's recommendation in the next issue of the news bulletin inviting comment. Each member of the Council shall be provided with copies or summaries of all correspondence regarding the proposal. At least four weeks shall elapse between publication and the vote on an amendment. If during this period 50 Regular or Honorary Members of the association, not more than 10 of whom shall be from the same Chapter, so petition, the amendment shall be submitted to the Regular and Honorary Members for a mail vote. A two-thirds affirmative vote of the Regular and Honorary Members voting shall be required for ratification. If no such demand for a membership ballot is received, the amendment may be ratified or rejected by the Council. Ratification shall occur whenever two-thirds of the members of the Council have submitted an affirmative vote either in person or by mail.

As stated in the above Article, if no demand is received for a mail vote to the membership in a period of at least four weeks from the date of this issue, the proposed amendment will be submitted to the Council for its consideration.

SAMUEL WEISS
Secretary-Treasurer
American Statistical Association

NEWS

New Officers—New ASA Directory —Summer Courses—Meetings and Conferences—New Publications

New Officers for 1954

The Committee on Elections reports the following officers elected as a result of the balloting which was sent to the membership last November:

President-Elect ..... RALPH J. WATKINS
Vice-President (1954-56) ..... HENRY SCHEFFE
Directors (1954-56) ..... JACOB MARSCHAK, DONALD C. RILEY
Representative-at-Large (1954-55) ..... DANIEL B. DELURY
District Representatives:
Northeastern District ..... CHESTER I. BLISS
Eastern District ..... GEORGE GARVY
Southeastern District ..... FRANK A. HANNA
North Central District ..... PAUL R. RIDER, LUCILE DERRICK
South Central District ..... WILLIAM KESTER
Western District ..... JOHN C. MCKEE

Plans for New ASA Directory

The Board of Directors of the American Statistical Association is planning a new Membership Directory. The last directory was issued in 1951 and is now badly out of date. The new directory will include the name, address and business affiliation of each member, as well as an indication of sectional interest—Biometrics, Business and Economic Statistics, Social Statistics, Training of Statisticians, and Statistics in the Physical Sciences. Members will be listed by geographical area and by sections in addition to alphabetically.

Directory cards are being mailed to the membership. Members are urged to return these cards promptly. Your cooperation is necessary if all members are to be included in the directory.

Symposium on Monte Carlo Methods

A Symposium on Monte Carlo Methods, sponsored by the Aeronautical Research Laboratory, Wright Air Development Center, will be conducted by the Statistical Laboratory, University of Florida, at Gainesville on March 16 and 17, 1954. Registration will be on Monday, March 15 for those who arrive early. An invitation is issued to those interested in the field to attend. Further information may be obtained by writing Professor H. A. Meyer, Building OE, University of Florida, Gainesville.

Following the Symposium, an Eastern Regional meeting of the Institute of Mathematical Statistics is being planned for Thursday, March 18, 1954 at Gainesville. The Biometric Society, ENAR is meeting on March 18, 19 and 20.

University of Michigan Summer Institute in Survey Research Techniques

For the seventh consecutive year, the Survey Research Center of the University of Michigan will hold its Annual Summer Institute in Survey Research Techniques. The dates for the regular session are July 19 to August 13, with an introductory session from June 21 to July 16.

This special program is designed to illustrate the theory and application of survey research to such fields as business and human relations, education, psychology and sociology, political behavior, public affairs, public health, economics, statistics, etc. Again this year a special workshop will be offered in the practical application of survey research methods to these individual fields. For further information write to the Survey Research Center, University of Michigan, Ann Arbor, Michigan.

Activities of the Southern Regional Education Board's Advisory Commission on Statistics

As a result of a recommendation of the Regional Conference on Statistics held at Atlanta in October, 1952, the Southern Regional Education Board appointed an Advisory Commission on Statistics with the following membership: T. A. Bickerstaff, University of Mississippi; R. W. Brown, Tuskegee Institute; H. H. Chapman, University of Alabama; Gertrude Cox, University of North Carolina; Boyd Harshbarger, Virginia Polytechnic Institute; Harold Hotelling, University of North Carolina; Arthur L. Irion, Tulane University; Carl E. Marshall, Oklahoma A. and M. College; Herbert A. Meyer, University of Florida; Joseph J. Moder, Jr., Georgia Institute of Technology; C. C. Murray, University of Georgia; H. M. Phillips, Emory University; Joseph A. Pierce, Texas Southern University; John R. Stockton, University of Texas. This Commission met twice during 1953 and has already initiated three projects.

The first of these is an inventory of the statistics facilities available at the colleges and universities in the South. Letters soliciting cooperation went to every accredited, degree-granting institution, and last fall a questionnaire was sent to the 208 institutions agreeing to participate in the survey. The questionnaires call for detailed information on existing programs of instruction, research and service in statistics in the South. The data thus supplied will be made available to the participating institutions, to aid them in program planning, and to such governmental agencies, foundations and business and industrial organizations as have an interest in using and supporting statistics facilities in the region.

Planning is under way for another two or three day Regional Conference on Statistics, to be held in June, 1954 on the campus of Virginia Polytechnic Institute at

Blacksburg, Virginia. There particular attention will be given to methods of intra- and inter-institutional organization for statistics instruction, research and consulting services; to relations between the universities and government and industrial agencies in regard to research in statistics; and to means of developing effective interplay among the institutional, professional, governmental and industrial personnel concerned with statistics in the South. By then, the inventory results will be known and will be available for use as the factual basis for the considerations of the Conference. About eighty delegates from educational institutions and consultants from government and industry will be invited to meet in the working sessions.

Finally, agreement was reached for joint sponsorship by North Carolina State College, the University of Florida, Virginia Polytechnic Institute, and the Southern Regional Education Board of a series of six-week cooperative Summer Sessions in Statistics. The first of these, which will be held at Virginia Polytechnic Institute from June 9 to July 14, 1954, was described in the December issue of The American Statistician.

NICB Economic Almanac

The National Industrial Conference Board issued in January the 1953-1954 edition of "The Economic Almanac." This volume contains 752 pages and 812 tables, and is designed to meet the needs of those concerned with current economic problems for a compact, convenient handbook of the latest, most significant and trustworthy statistical data. Considerable new material has been added to this twelfth edition, particularly in the fields of population, consumption, prices, living standards, individual savings, consumer credit, trade, service, public finance, and international economics.

The Conference Board's own data are used wherever available, but Government statistics as well as those of trade associations and other private sources are also used extensively. Brief notes indicating the sources, and in some cases the limitations of the data, are given for each table. A glossary of selected terms and an alphabetical designation of governmental and international agencies are included, as well as a general index.

To assure wider distribution, "The Economic Almanac" is being published for the first time by a trade publisher, the Thomas Y. Crowell Co., New York. The price of the Almanac is $3.95.

U. K. Annual Abstract of Statistics

The 90th edition of the "Annual Abstract of Statistics" was published in November 1953. The Abstract not only covers the principal economic series, but also provides one of the most comprehensive collections of statistics relating to social conditions in the United Kingdom available to the public. A few new tables have been added, including ones on the composition of private households, dwellings occupied by private households, educational building, size of manufacturing firms, retail establishments, and capital issues. The "Annual Abstract of Statistics" is available from the British Information Services (Sales Section), 30 Rockefeller Plaza, New York 20, N. Y., at the price of $4.75.

International Conference on Vital and Health Statistics

The first International Conference of National Committees on Vital and Health Statistics was held in London from October 12 to 17 under the auspices of the World Health Organization. The United Kingdom General Register Office acted as host to the Conference which was attended by delegations from 28 Member States and Associate Members of WHO.

Members of the U. S. Delegation were: Halbert L. Dunn (chairman), National Office of Vital Statistics, Public Health Service; Eugene L. Hamilton, Office of the Surgeon General of the Army; and Iwao M. Moriyama, National Office of Vital Statistics. Advisers to the delegation were: Edwin F. Daily, Health Insurance Plan of Greater New York; Harold F. Dorn, National Institutes of Health; and Philip M. Hauser, University of Chicago. All members of the delegation and advisers are members of the U. S. National Committee on Vital and Health Statistics which is appointed by the Surgeon General of the Public Health Service.

The Conference carried out its program of work through two Committees, one dealing with the general subject of objectives, organization and programs of National Committees or equivalent bodies as well as with types of health statistics and related vital statistics which will be of greatest practical value to countries at different stages of development; the other considered mainly the methods most suitable for improving the quality of health statistics and related vital statistics and for securing wide appreciation of their value.

It is expected that the final report of the Conference will be published by WHO early this year.

U. N. Study on Industrial Census Methods

A comprehensive manual designed to give guidance, especially to countries with limited statistical experience, on the many phases of taking industrial censuses was published on December 14 by the United Nations in a two-volume work entitled "Studies in Methods: Industrial Censuses and Related Enquiries." Volume I covers the planning and preparation for a census, discusses alternative methods for the collection, compilation and tabulation of data in comprehensive and sample enquiries, and gives a historical survey of the experience of over 30 countries and a summary of the work and recommendations of international agencies in the field of industrial censuses as well as a bibliography on the subject. Volume II contains numerous examples of forms used and schedules designed for industrial censuses and related enquiries.

"Studies in Methods: Industrial Censuses and Related Enquiries," may be obtained from Columbia University Press, 2960 Broadway, New York City. The price is $2.50 for each volume.

New ISI Members

Twenty-five candidates were elected to ordinary membership in the International Statistical Institute in 1953. Among these were the following from the United States: Miss Besse B. Day, and Messrs. Joseph Berkson, E. J. Gumbel, and John W. Tukey. In addition, S. Manuila, formerly Director of the statistical services of Roumania and now a resident of the United States, was elected in a non-national category.

Federal Statistical Activities

Revision of Federal Reserve Board Index of Industrial Production

The Board of Governors of the Federal Reserve System on December 18 released the basic postwar revision of the index of industrial production. The more obvious major features of the revision are an up-dating of the comparison base period from 1935-39 to 1947-49 and a change to the Standard Industrial Classification from the prewar Census classification system. More substantive features relate to the up-dating of the weight year from 1937 to 1947, enlargement of the number of monthly series from 100 to 175, substantial improvement of many old series, the development of independent annual indexes to which the monthly indexes are adjusted, and new seasonal factors for all major groups.

The revision so far applies mainly to the period from 1947 to date. For the earlier period the Board has adjusted its old manufacturing indexes for the years 1939-1947 to the comprehensive benchmark changes developed by a joint Census-Federal Reserve project, and has linked the old to the new in January 1939 for the period back to 1919. Similar benchmarks and links were made for minerals. These interim revisions have been done at the level of the major divisions of the index in order to facilitate comparisons with the more recent period.

In a general way, changes in industrial activity since 1947 are shown to be similar by both the new and the old total indexes. In the first half of this year, both indexes indicate that activity was at a record level for the postwar period, about one-eighth above a year ago. Both show that since mid-year, output has been reduced fairly generally. For December, the new index was about 7 per cent below the high which it established in May and again in July; the old index was also down about 7 per cent from its peak reached in March. Both indexes show that industrial production in December was below the level of a year earlier. Relative to 1947, however, the new index shows greater growth than the old.

The Board has published two articles in the December Federal Reserve *Bulletin*, the first being a general discussion of the results and the second being a detailed description of the new index. Copies of these articles in reprint form together with detailed tables on description and sources of data and the revised index numbers are available upon written request to the Board's Division of Administrative Services.

M. H. Schwartz,
Business Conditions Section, Division of Research and Statistics, Board of Governors of the Federal Reserve System

New Census Report on Government Finances

The lack of firm comprehensive aggregates of local government expenditure—last provided by the 1942 Census of Governments—has in recent years been noted by the Joint Committee on the Economic Report as a serious gap in available statistical information needed for economic analysis. Such data are now available from the Census Bureau's recent "Summary of Government Finances in 1952," which shows local government expenditure totaling $20.1 billion in fiscal 1952.

This report continues previous annual Census series on governmental revenue and debt, and brings together Federal, State and local government expenditure amounts (altogether totaling $101.5 billion in fiscal 1952) in terms of a consistent classification pattern by function and by character and object. It also supplies summary data as to borrowing, debt redemption, and cash and security holdings of State and local governments, as well as statistics on intergovernmental transactions.

All-government totals in this publication are broken down by level of government (Federal, State, and local), with detail also for major items by type of local government (city, county, school district, township, and special district). However, no geographic breakdown is provided; the limited cross-section sample of units used to obtain local government figures is not adequate in size or design to support estimates by State or region. The few summary tables in the report are accompanied by a detailed text which provides supplemental statistics, defines reporting categories, and describes data sources and survey procedures.

Copies of this report may be obtained at 20 cents a copy from the Bureau of the Census, Washington 25, D. C.

Allen D. Manvel,
Chief, Governments Division, Bureau of the Census

1950 Handbook of Old-Age and Survivors Insurance Statistics

The Bureau of Old-Age and Survivors Insurance of the Social Security Administration, Department of Health, Education and Welfare, has released the 1950 Handbook of Old-Age and Survivors Insurance Statistics, the tenth in a series begun in 1939. The Handbook provides data on the wage and employment experience of workers in covered employment in 1950 and during the period 1937-50. It contains the only regularly released data on the work history of individuals over a period of years and on annual earnings of individuals in specific industries in the United States.

The statistics, which are based on a one-percent sample (about 900,000 accounts), provide distributions by age, sex, and race of the workers as well as by annual and cumulative wages, patterns of years of employment, labor mobility, number of quarters of employment, old-age and survivors insurance status, and State and industry of employment. This Handbook shows data on the changes in the number of insured accounts resulting from the 1950 Amendments to the Social Security Act. An accompanying text explains the data.

Copies of the "Handbook of Old-Age and Survivors Insurance Statistics, 1950" may be purchased, at $1.00 each, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

Irwin Wolkstein,
Division of Program Analysis, Bureau of Old-Age and Survivors Insurance, Social Security Administration

Annotated Bibliography of Statistical Yearbooks

The Census Library Project, sponsored by the Library of Congress and the Bureau of the Census, has issued an annotated bibliography of the general statistical yearbooks of major political subdivisions of the world. The publication, entitled "Statistical Yearbooks," shows for more than 200 countries, colonies and territories the general statistical yearbook, its history, the contents of the most recent issue and the location in Washington of the last five issues.

For purposes of this bibliography, a general statistical yearbook is defined as "the annual compilation of data issued by a

country for the purpose of providing a convenient summary of the most recent statistical information available about the country." Where no compilation fitting this definition was available, the nearest equivalent—such as an administrative report of a colonial governor or a report on a trust territory of the United Nations—has been included.

The arrangement of the bibliography is alphabetical by country, colony or territory under six major geographical subdivisions—Africa, North America, South America, Asia, Europe, and Oceania. The annotations are more detailed for divisions of demography, the field of major interest to the Census Library Project, than for other social and economic statistics. The bibliography was prepared by Phyllis G. Carter, Chief of the Census Library Project.

Copies of the 123-page "Statistical Yearbooks" may be purchased from the Card Division, Library of Congress, Washington 25, D. C., at 90 cents each.

1953 Statistical Abstract of the United States

The Bureau of the Census has recently issued the 1953 edition of its annual compendium, the *Statistical Abstract of the United States*. This one-volume basic reference source has been issued annually since 1878 and is the standard summary of statistics on the industrial, social, political, and economic organization of the United States. It includes a broad selection of data from most of the important statistical publications, both governmental and private, and an extensive bibliography of statistical sources.

The 1953 edition of this publication contains compact summations and highlights from the great bulk of final reports of the 1950 Censuses of Agriculture, Population, and Housing; and much new material on share ownership, on marriage and divorce, on the survival of new businesses, on business and government research expenditures, on individual and family income, on State gubernatorial elections, and on many other subjects. A noteworthy change in this edition is the more convenient assembling and expansion of statistics for United States Territories and possessions into an entirely separate section. This is all in addition to the basic information included in previous editions which has been brought up-to-date.

The value of the "Statistical Abstract" for ready reference is enhanced by the inclusion of a 39-page alphabetical subject index, a 34-page section of sources of statistical information, 45 charts and maps, and the non-technical explanations which precede the sections.

Copies of the 1953 edition, bound in buckram, may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at $3.50 a copy. The "1953 Statistical Abstract" is also published as House Document 99, 83rd Congress, 1st Session.

WILLIAM LERNER,
Office of Assistant Director for Statistical Standards, Bureau of the Census

New Commerce Department Series of Advance Retail Sales Reports

The U. S. Department of Commerce inaugurated in November its new series of Advance Retail Sales Reports. These reports, covering sales during the month, are available about the tenth of the following month.

The Advance Retail Sales Report anticipates by almost a month the regular Monthly Retail Trade Survey of the Bureau of the Census, and gives less kind-of-business detail. The reports include data for the more important 2-digit kind-of-business groups, and for grocery stores, department stores, and drug and proprietary stores. Two tables are presented showing dollar sales and percentage changes from the previous month, from the same month a year ago, and for the year to date compared with the same period last year. The first table, compiled by the Bureau of the Census, shows unadjusted figures; the second, prepared by the Office of Business Economics, is adjusted for seasonal factors and trading day differences.

The reporting panel used for this report includes about 1,400 single-unit establishments and establishments of firms operating fewer than 11 stores which are located in the 230 sample areas used for the Census Bureau's Current Retail Trade and Population Surveys. In addition, it includes a group of about 200 large multi-unit organizations. The panel is based on a probability sample design and is a subsample of the panel used in the Monthly Retail Survey.

The Advance Retail Sales Report was initiated as part of the spot check program being conducted by the Census Bureau, and is designed to help implement the Secretary's policy to provide, on a timely basis, reliable data needed by businessmen. Copies of the report may be obtained from the Business Division of the Bureau of the Census.

HARVEY KAILIN,
Chief, Business Division, Bureau of the Census

RESOLUTIONS PASSED AT THE ANNUAL MEETING OF THE AMERICAN STATISTICAL ASSOCIATION

December 28, 1953, in Washington, D. C.

1. Resolution regarding the Program Committee

RESOLVED that the members and officers of the American Statistical Association express deep appreciation for the excellent program prepared by members of the Program Committee under the leadership of Herbert Solomon, Chairman.

2. Resolution regarding the Local Arrangements Committee and the Washington, D. C. Chapter

RESOLVED that the members and officers of the American Statistical Association express their profound appreciation to the Local Arrangements Committee under the Chairmanship of Donald C. Riley and to all of the individuals of the Washington, D. C. Chapter for their outstanding work and hospitality in connection with the arrangements for the 113th Annual Meeting of the Association.

Limits of Mathematics in Statistics

By W. S. WOYTINSKY
Washington, D. C.

It is difficult to discuss the limits of mathematics in statistics without having located the latter in the system of the sciences. Moreover, the problem of the relation of statistics to other sciences is very different from that of the relation of statistical work to other activities.

Statistics as a Profession

In 1944-45 the American Statistical Association approached the latter problem in connection with the development of the National Roster of Scientific and Specialized Personnel. Jointly with the Institute of Mathematical Statistics, the Association took part in defining the profession of statistics. They defined a statistician as a person "versed in the science of collecting and analyzing numerical data,"[1] with a strong emphasis on mathematical methods and only a casual reference to the self-evident requirement that a statistician must be familiar with the field from which his statistics come.

Such a definition meets the formal requirements of the Roster but does not attempt to bring statistics into relationship with other sciences. If statistics were nothing but mathematics applied to a definite type of observations, there would be no limits to mathematics in this field except those determined by the quality of the material, the progress of mathematical methods, and the mathematical skill of the statistician.

Two Definitions of Statistics

A satistician often feels a double allegiance – to the particular field of his work and to the method he is using. Some associate themselves primarily with their particular field of work – population problems, foreign trade, markets and prices, labor economics, quality control, astronomy. Others regard the particular character of the material on which they are working as more or less accidental and feel that statistics is essentially the same in all fields.

All branches of economic and social statistics have much in common, since they all deal with human beings, as individuals or social groups, and with their behavior and their relationships, and all use, largely, the same sources of information. All governmental, international, and business statistics belong to this broad field, and it is the field of activity of the great majority of professional statisticians.

For them, the controversy about the place of statistics among other sciences boils down to this alternative: is statistics simply a branch of applied mathematics, or does the term cover two distinctly different disciplines – one, an assortment of methods of conducting and interpreting quantitative observations, and the other, those sections of the social sciences in which some of these methods, combined with other scientific devices, are commonly used.

When such a distinction is made, the first discipline appears as a mathematical science and its character is not changed by the requirement that the statistician must be familiar with the field from which the observations come – a requirement which means simply that he must know what he is talking about. The second discipline belongs to the family of social, historical, political, and moral sciences, and its association with other sciences of this group is not weakened by the fact that it works with figures and uses mathematical methods for collecting and analyzing information. In the first discipline, mathematics is supreme. In the second, its role is limited by the character of data.

Opinions can differ in this field, but I feel very strongly that the laws which control human behavior and the evolution of social relations are so complicated that we can seldom express them in a few words without adding a long list of reservations, exceptions, and corrections, and still less squeeze them into an algebraic formula.

Hence the limits of mathematics in statistics are fairly narrow when the term statistics is used to designate the quantitative analysis of economic, social, and historical phenomena.

The Law of Population Growth, As Seen by an Astronomer

In the 1890's a mathematician and astronomer, N. S. Pritchett of Washington University, offered a formula for predicting the population of the United States. His formula was a third degree parabola fitted to census data from 1790 to 1890. The fit was excellent and Pritchett did not hesitate to extrapolate his formula

[1] As suggested by O. C. Stive in ASA Bulletin, February 1945, p. 3.

in the next millenium. Thus, he found that by 2900 our population will reach 41 billion, in round numbers.

Three things were wrong with his projection: first, the contention that the growth of population in a country can be expressed by a mathematical formula; second, the assumption that such a formula must present the future population as a function of a single variable – time; third, the belief that the shape of this formula for the coming millenium is revealed by the experience of the preceding century.

This case of an astronomer's invasion of the realm of population science is typical of what happens when too much mathematics is combined with too little nonmathematical observation.

Recent Population Projections

Keeping to the field of population studies, let us examine the population projections prepared by our outstanding experts in the 1930's and 1940's. Their projections deserve a place of honor in the history of statistical methodology as specimens of unsurpassed statistical skill and patience. Their only weak point is that they proved to be false. The highest estimates for 1952 were: approximately 146.8 million, in the projections prepared in 1937, 147.3 million in the projections released in 1943, and 149.3 million in those published in 1947. For the year 1975 the medium projection of 1947 gave a probable population of 160.6 million, as compared with the Bureau of the Census's most recent estimate of 193 million which probably is still too low.

The common mistake of our official population forecasters was in their inclination to extrapolate the decline in natality in the 1920's and the first half of the 1930's. They attributed to a temporary phenomenon the character of a final long-range trend – an error of judgment which our population experts shared with many other observers. I do not intend to blame them for this error, but I should like to stress the moral of the story: a combination of excellent statistical technique and an erroneous assumption necessarily results in a false forecast, and the results could not be much worse if the technique of computation were less elaborate.

A population forecast is nothing more than a numerical expression of our judgment about the probable future behavior of people in the field of reproduction. In this realm a superb mathematical technique, a host of statistical clerks, and a battery of calculating machines are no substitute for intuition.

Essentially all these mathematical paraphernalia add very little to the judgment which underlies the projection.

The elaborate assumptions for natality by age of women and mortality by sex and age can be replaced by reproduction rates, and the system of charts, formulas, and tables can be replaced by simple reasoning. Ultimately the projection will show a growth in population if we have assumed that it will grow, and a decline if we have assumed that it will decline.

Frank Notestein has shown convincingly that population projections can be developed without the aid of any mathematical formulas and calculators, on the basis of broad historical considerations. His reasoning is very simple. In order to form an opinion on the probable future course of events, we must study the history of population in the past.

This approach does not belittle the importance of population statistics. They help us to form our judgment but they cannot do our thinking for us. The mathematical apparatus becomes misleading when it conveys the appearance of objectivity and finality to our very subjective judgment.

Economic Projections and the Consumption Function

When World War II was approaching its end, economists in this country were sharply divided into two camps: those who anticipated a postwar depression and mass unemployment, and those who predicted a long period of economic expansion, a high level of employment, and latent inflationary pressure.

Mathematically speaking, the controversy hinged on the so-called saving-consumption function. Because the United States was emerging from the war with a nominal national income several times as large as before the war, some experts believed that the rate of savings in the nation would increase tremendously and that this increase would lead to a deflationary gap and mass unemployment. The consumption function was the crystal ball of this school of thought: not only did it make the forthcoming depression look iminent but it also provided an estimate of future unemployment. In some projections the estimate was set at 10-15 million, in others it was caleulated with precision to the thousands. The estimate depended essentially on the kind of saving-consumption function used by the forecaster.

Later, the Department of Applied Economics of the University of Cambridge prepared a fairly complete bibliography of the consumption function and a survey of equations developed by different authors. A total of 118 consumption functions are listed in this survey, 93 turned out in the United States and 25 contributed by other countries. I was horrified to find in the list 21 consumption functions credited to me.

With few exceptions, this is the way the United States consumption functions were found. You take the national income data of the U. S. Department of Commerce for 1929-39 and unofficial data for a few preceding years and select two series – one, consumption at current or constant prices or the ratio of consumption to disposable income; the other, disposable income or per capita income at current or constant prices. Next you prepare a scatter chart for the two series and fit the regression line to the empirical points. Or you compute the correlation equation between the two series. If you are not completely satisfied with the fitting, you can improve it by introducing an additional variable, such as time, population growth, the preceding highest or lowest point of disposable income, and so forth.

The weak point in this procedure is the same as in other auguries. From the same data you can deduce all kinds of formulas, just as there are different ways of reading the future from tea leaves. Actually, in order to use the consumption function or any other crystal ball in economic forecasting, you must have an opinion on the trend of events. If your opinion is sound, there is a fair chance that you will pick the formula which later will be vindicated; if your judgment is poor, you will gamble on a wrong formula.[2]

The Scatter Chart and Regression Line

A scatter chart is an excellent medium for presenting the relationship between two statistical series. Since each dot on the chart can be "personalized," the plotting shows not only the general pattern of the distribution but also the behavior of individual dots which may be controlled by factors not shown on the graph. Moreover, a scatter chart is strictly limted by its four extreme ordinates. The analyst is positively warned not to trespass beyond these limits, and as long as he observes this warning he can use the scatter chart at any state of a study of relationship between two phenomena. The algebraic treatment of the same problem is often a step backward. First, the analyst loses the identification of the single dots; next, he waives his ability to appraise the relative significance of each dot; and ultimately he is encouraged to make sweeping generalizations and stray beyond the limits of his observation, both in space and in time.

On a scatter chart we are dealing with real things systemically arranged for better comparability. In an algebraic treatment, the real things are replaced by their shadows, coupled numbers.

Fitting Curves to Statistical Series

The first degree consumption-saving function is a particular case of the use of a straight regression line for extrapolating a statistical series. The latter procedure is, in turn, a particular case of fitting a mathematically defined line to a statistical series. Such an operation is very common in practical statistics and can be considered as a typical application of mathematics to the interpretation of statistical data.

The purpose of the operation is to visualize the main movement of a series hidden behind its short-time oscillations. In many cases the free-hand method provides the most logical and convincing solution of the problem. The only serious objection against it is its arbitrary character. However, the element of arbitrary decision is present in every fitting. It appears in the selection of the chronological limits of the series and in the choice of the algebraic form of the curve. Moreover, in what respect are mathematical curves more objective than a carefully drawn free-hand line which bypasses the erratic points, irons out the minor fluctuations, and throws into relief the main development in the different phases of the surveyed period?

Extrapolation

Each curve fitted to an empirical series, whether drawn by the free-hand method, caluclated according to the rule of the least squares, or developed by a moving average procedure, describes a definite characteristic of the series but possesses no quality for extrapolation. An exception is often claimed for two types of fitted lines – for the straight regression line and for the curve of growth at a constant annual rate. There is, however, no logical justification for such claims.

The fallacy of economic forecasts based on mathematical formulas – including the straight line of regression – can be proved mathematically. In projections, time is a reversible variable. If a formula can be projected into the future, it must be at least as good when projected into the past. I have seen no regression formula that could stand this test.

In brief, there is only one golden rule for the use of fitted curves and regression lines in economic projection: Keep away from them!

Price Indexes

A statistician's problems are nonmathematical even when he makes use of mathematical devices. Construction of price indexes illustrates this point. No index can be built without reference to the methods of weighting, but the choice of the weighting formula

[2] As a post mortem to the consumption functions, it is worth mentioning that the data on which the 93 United States equations were based have been drastically revised by the Department of Commerce, which makes all the formulas obsolete and meaningless. This was no disappointment to me as the author of 21 formulas concocted with the only objective of reducing the whole procedure ad absurdum but was probably a serious shock to those who had taken their algebra seriously.

and selection of items and weights are not mathematical but economic and social problems.

Construction of a cost of living index, for example, begins with a study of consumer budgets, an extremely complex statistical procedure with a very thin mathematical varnish. Research on consumption patterns is not only a piece of social research but also a piece of social policy. It demands an understanding of the social problems and trends of our time, as well as imagination and courage. Long experience and extensive studies are required of a statistician entrusted with such a project, while the mathematics needed for constructing an index form a short chapter in elementary textbooks of statistics.

Statistics of World Trade

The main service of mathematics in statistical analysis is to reduce the chaos of single observations to a logical pattern.

As an example, I would refer to the statistics of world trade. Because of the differences in classification and the meaning of foreign trade for nations of different size and economic structure, statistics of foreign trade represent a chaotic agglomeration of figures. It is a fascinating task to reduce them to a clear and logical system! This task requires not only a deep knowledge of international trade, but also imagination, patience, and extensive clerical work in regrouping and reclassifying available data. The description of the network of world trade before World War II developed by Dr. Hilgert of the League of Nations is a brilliant example of statistical work of this kind, of the most difficult statistical analysis. In this analysis, however, mathematical formulas are conspicuous by their absence.

Cooperation of Statisticians and Mathematicians: The Logistic

Sometimes, despite all his efforts, the statistician or economist feels that he is unable to discover any logical system in the chaos of statistical data at his disposal (as Hilgert, for example, was unable to outline the general pattern of foreign trade after World War II in a form similar to his charts in the Network of World Trade). The cause of their failure can lie in the character of the data: not all phenomena can be described in a simple form. Often, however, the statistician decides that the cause of his failure is in his lack of mathematical skill. Then he turns to an expert mathematician, explains his problem, and asks him for a formula which will answer such and such specifications. A good mathematician can always oblige a nonmathematician with a formula which solves his problem. A combination of statistical and mathematical skills invested in two different persons is, however, a dangerous thing and the cooperation of a statistician who is not familiar with mathematics and a mathematician who is not familiar with statistics is often disappointing.

The production function developed for Paul Douglas by his mathematical colleague contributed very little to his analysis of the share of labor in production. Most instructive, however, is the experience of Raymond Pearl and his population logistic.

The application of a logistic function to population analysis is an old and simple trick. Characteristic of a development portrayed by a logistic are a period of equilibrium (represented by the lower horizontal asymptote) and a subsequent period of growth, with an annual increment which increases steadily up to a definite point and declines gradually thereafter, until a new equilibrium is reached (represented by the upper horizontal asymptote). This general type of growth can be expressed by various algebraic formulas. A characteristic of a logistic is the assumption that the absolute annual increment diminishes after the culminating point in the same way in which it increased up to that point. When the analyst decides to use a logistic in portraying the growth of population, he arbitrarily postulates that the future population curve will be symmetrical with that from the hypothetical beginning of the cycle to the culminating point. Sometimes he postulates simply that the growth will stop at a definite level. As arbitrary as this procedure may appear, it is methodologically superior to the fitting of the logistic to the few empirical points at its beginning and letting algebra determine the location of the upper asymptote of the curve, i.e., the limit of the population growth. Indeed, it is easy to prove that a slight, hardly perceptible change in the last two empirical points — often the shift of the last point alone — changes drastically the whole projection. Assuming that we can determine the location of the inflexion point on the hypothetical population curve, which represents the first half of the population cycle, two questions arise: Why should the population growth in this period be portrayed by half of a logistic? And why should its subsequent growth be represented by the same curve turned 180° around the inflection point?

The logistic — or a system of two curves of any shape symmetrical to each other in relation to the hypothetical turning point — has some merits in the analysis of population growth. However, when using this device, we must remember that there is nothing objective or mathematical in the inflection point on which the curve hinges. The location of this point — or the upper asymptote — is a question of the analyst's judgment.

The common feature of the production function of

Paul Douglas and the population logistic of Raymond Pearl is that in both cases the cooperation of outstanding statisticians with skilled mathematicians gave less than satisfactory results. Following the line of inductive thinking, I am inclined to interpret this result as evidence that a statistician should use as many statistical devices as he can handle and never ask a mathematician or astronomer to lend him his tools.

Errors in Statistics

The trouble with applying mathematics to statistics related to human behavior is that these statistics are not mathematical values. In some respects they are less, and in other respects more, than that. They are less than mathematical values because they imply a considerable margin of error and are subject to continuous revisions. They are more than mathematical values because they are living things, must be combined with a great variety of other data, and can be interpreted in a much deeper and more flexible way than mathematical data.

As an illustration of the fluidity of data of economic statistics, I would refer to international statistics of agricultural production and foreign trade. Those who work in this field know that The Food and Agriculture Organization completed only in 1951 the revision of the averages for 1934-38 and the Economic Services of the United Nations and the International Monetary Fund are still revising and adjusting their data for the same period.

How can we analyze mathematically a series when we do not know which of its items are final and which not? Moreover, very often the most striking items of an international series are native to exotic countries and there is always a suspicion that they were affected by terminological misunderstanding, gaps in reporting, or some crossing of wires. The statistical analysis of a series begins with an appraisal of its items. Their appraisal often leads to the conclusion that the extreme values, the king-pins of the series which determine its mathematical character, should be discarded. In this way, for example, we handle the too high and too low mortality and natality rates reported by the countries with poor statistical services.

Usually students who work in the field of international statistics are aware of the limitations of their data. Corrado Gini in Italy and Josiah Stamp in Great Britain in their surveys of national income of different countries classified them by the degree of reliability. Robert Kuchinsky tried to estimate the margin of error in world population statistics. Julius March in France stressed the subjective factors affecting vital statistics. The U. S. Public Health Service in its international surveys of vital statistics points out the unreliability of some figures. Similarly the Statistical Service of the United Nations does its best to warn the consumer against doubtful items.

In brief, statisticians have no illusions about the precision of their data and try to handle them in accordance with what they are. But these limitations of statistical data can neither be measured nor corrected mathematically, and this makes their mathematical treatment misleading.

Mathematical Margin of Error

In releases of statistical data based on a sample, the Bureau of Census – and some other agencies – often point out the margin of error introduced by the sampling procedure – that is, the probable maximum difference between the estimated figures and those which would have been obtained from a complete census taken at the same time, by the same enumerators, with the same schedule.

In one respect, however, this warning falls short of its purpose. The sampling procedure is not the main source of error. Much more important is the difference in the methods of enumeration, selection of enumerators, and other conditions. A sample interview does not duplicate the psychological climate of a nation-wide census, and a census cannot duplicate the conditions of a sample survey.

When you work with statistical data of different kinds, especially with international statistics, you learn to know that there is no such thing as precise statistics or strictly comparable series. You learn to understand that all statistics are approximations and there are always some subtle divergences even in the most strictly comparable data. And ultimately you learn to forgive statistics their minor weaknesses. You study their origin, do your best to appraise them, and then you use them – if they are not exceptionally bad.

Two Worlds: The Mathematical and Statistical

Concluding my remarks on the limits of mathematics in social and economic statistics, I should like to stress that I do not belittle the role of mathematics in the whole field of knowledge. Nor do I criticize statistics for the lack of precision and the subjective character of their definitions, classifications, and interpretation. The purpose of these remarks has been solely to emphasize the fundamental difference between the realm of social and economic statistics and that of mathematics. The realm of mathematics is the Universe, with a capital U, the cold, bloodless, abstract Euclidian universe, subject to rigid eternal laws. The realm of statistics is different. It is the world of human relations and human behavior. It is full of life and for this reason full of confusion and contradiction. Every time we try to measure the phenomena of this

CONTINUED ON PAGE 18

ONE CONSUMER'S VIEW OF THE CURRENT POPULATION SURVEY*

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INTRODUCTION. The U. S. Census Bureau conducts a monthly sample survey of the population of Continental United States. This survey, originally designed by the Works Progress Administration, was largely motivated by the need for having a regular recurrent estimate on the volume of unemployment in the total country. Accordingly, the sampling and questionnaire procedures were evolved with the aim of producing a really reliable figure on the volume of unemployment. By definition, of course, reliable information on this subject would also provide reliable information on certain related aspects such as the volume of employment. Since the late 1930's and particularly since the survey was taken over by the Bureau of the Census, the sampling and other procedures have been constantly modified and improved, and today the survey is an excellent one given the purpose for which it was originally designed.

In the last fifteen years, however, two very important changes have occurred which, it seems to me, call for a reevaluation of this program. The first change, which we hope is permanent, is the shift from large-scale unemployment to full employment and the diminution of the number of unemployed to a small and almost unmeasurable quantity. Thus, the original purpose for which the survey was designed has to a considerable extent become obsolete, and new uses for the survey have emerged.

The second major change has to do with our vastly increased knowledge of the internal mechanism of the labor force. When the current population survey was first undertaken, students had only very tenuous information about the internal nature and function of the labor force. At that time, then, establishing the broad outlines of the problem and finding a few of the answers constituted a very substantial contribution to knowledge. Because the main outlines have been put in, however, students of the subject now are faced with the problem of obtaining much more detailed information about many of the so-called "small points," questions which fifteen years ago were barely concidered. In my opinion there is no question but that manpower research has now reached the point where we must conduct a great deal more research of a detailed and intensive nature aimed at establishing the exact patterns whereby the 100 million people function so as to produce what we call U. S. manpower. To do this, I submit, calls for some revision of the basic statistical collection program.

A third consideration which has always been important but was excluded from the survey since its very inception is that of "local area" estimates. By "local area" is meant individual states (or appropriate combinations of small states) and larger cities or metropolitan areas. The need for such information more often than once every decade (at the time of the decennial census) has long been recognized but has never been met by the Current Population Survey. It seems to me that the time has come to pay more attention to this need.

The present sampling plan of the Current Population Survey. It is not my point to go into a detailed examination of the sample underlying the monthly poplation survey. The subject has been described in great detail by Mr. Hansen and his staff, and full information is available on all aspects.[2]

Basically, the sample as of mid-1953 consists of about 25,000 households distributed among 68 primary sampling units throughout the continent. Within each primary sampling unit sub-samples were set up so that ultimately the smallest phase of the sample is a segment of six households, more or less. The 25,000 households include perhaps under 90,000 persons, since the average number of persons per household in 1950 was only 3.38. The number of cases involved, however, is no criterion of the accuracy of the sample. A sample of that size, if properly drawn, certainly can be a highly accurate representation of the total population.

Apparently the sampling scheme is to be modified somewhat in the near future. The writer has not seen any official statement regarding the new design

* Paper delivered before the Albany Chapter of the ASA, May 27, 1953.

[2] See, for example, Joseph Steinberg, "Sampling in the Current Population Survey," *Papers on Labor Force Statistics in the United States*, U. S. Bureau of the Census, Washington, D. C., 1952, Technical Paper No. 11.

(as of the time this paper is being prepared for publication) but understands its essential elements to be as follows. The number of cases will remain the same, but the number of primary sampling units will be increased. The main effect of this, supposedly, will be to decrease the sampling variability relating to agricultural employment and perhaps such other variables as are geographically nonuniformly distributed; the variability of most of the other estimates may not be reduced substantially.

Limits of the present sample. Since its inception the monthly sample has been used for many purposes other than that for which it was primarily designed. This can be seen by the very fact that the name was changed several years ago from the "Monthly Report on the Labor Force" to the "Current Population Reports." Originally most of the reports which came from the sample had to do with the broad outlines of the labor force, with emphasis on the volume and demographic characteristics of the unemployed. With the growing realization that there was a great need for the vast volume of related data which the sample did or could provide very easily, a large amount of additional material was collected and made available for analytical purposes. Subsequently, the name was changed to denote that the survey is now in effect a monthly sample census of Continental U. S.

This more intensive use of the sample data has involved more and more subdivision of the data. Originally, labor force and employment status by age and sex were considered almost sufficient for analytical purposes. Before long it was recognized that it was desirable to subdivide the data still further by color, marital and dependency status, migration status, hours worked, occupation and industry, and other characteristics of the population or of the economy.

As a result of such continuous subdivision — a subdivision necessitated by the fact that we are trying to get detailed answers to very specific problems — the numbers involved upon which the answers are to be based become progressively smaller. Accordingly, the size of the sampling variability, given the present design of the sample, increases considerably.

As an example, let us consider the following table showing the number of persons who worked 40 hours or more per week in non-agriculture. The thought behind this table is as follows: the amount of overtime may be positively related to business conditions, and change in the amount of overtime may possibly foreshadow changes in business conditions. Since 40 hours is the more or less accepted length of the work week, we may note the monthly changes in the numbers (and percentages) who have worked over this amount as an approximation to true overtime, i. e., the number of persons who received overtime pay.

Column *a* shows the total number of persons estimated to have been working in non-agriculture in each of the months; column *b* shows the estimated number who worked over 40 hours per week; and column *c* shows it as a percentage of the total. The approximate size of the sampling variability is shown in column *d* and the change in numbers from one month to the next in column *e*. Comparison of columns *d* and *e* reveal that in most cases the month to month changes are smaller than the size of the sampling variability. The periods in which the change is much greater than the variability seem to reflect seasonal movements. The decrease in September, 1953, resulted in large measure from the Labor Day holiday. Holidays and vacations in July and August decrease the total numbers at work as well as the numbers who work 40 hours or more. The Christmas season leads to an increase in both figures. The seasonals can be removed from the data, of course, in which case we seem to be left with monthly changes which are within the size of the sampling variability. In short, it is difficult to use these data for measuring accurately, changes in numbers of overtime workers.

Estimated Numbers at Work and Working Over 40 Hours Per Week, in Non-Agriculture:

July, 1952, to October, 1953

(Numbers in Thousands)

Month	Total No. Workers	Worked Over 40 Hours Per Week			
		No.	%	Sampling Variability	Change from Preceding Month
1953	(a)	(b)	(c)	(d)	(e)
October	53,574	17,947	33.5	490	+4172
September	52,424	13,775	26.3	460	—4507
August	51,340	18,282	35.6	490	+ 902
July	49,474	17,380	35.1	460	—1518
June	52,696	18,898	35.9	490	+ 168
May	53,522	18,730	35.0	490	— 178
April	53,212	18,908	35.5	490	— 490
March	54,068	19,398	35.9	490	+ 128
February	53,532	19,270	36.0	490	+ 106
January	53,012	19,164	36.2	490	—2180
1952					
December	54,304	21,344	39.3	500	+ 598
November	53,886	20,746	38.5	500	+ 498
October	52,752	20,248	38.4	500	+ 400
September	52,328	19,848	37.9	500	+1568
August	50,228	18,280	36.4	490	+ 898
July	48,640	17,382	35.7	460	—

Data from U. S. Bureau of the Census, *Current Population Reports, Labor Force*, Series P-57.

Calculating the sampling variability is actually a more complicated process than the reader may have been led to believe. The Census reports carry this statement: "The estimates of sampling variability shown . . . are not to be applied to estimates of month-to month change. The ratio of two successive published estimates of any labor force characteristic is likely to be relatively more reliable than either of the

two estimates from which it was computed" (last page of each release in Series P-57). It should be noted, however, that no information is given by the Census Bureau on the size of this sampling variability so that there is no way which the user has for revising column *d* in the table presented here. The only point which seems clear is that the sampling variability would have to be reduced greatly in order to detect any non-seasonal changes in column *d*.

It is clear that there are a very large number of questions which can be asked but which cannot be answered given the present amount of sampling variability in the current population survey. For the purposes of this article no further examples will be presented.

It should be remembered, futhermore, that the sampling variability as calculated by the Census Bureau is: "the chances are about 19 out of 20 that the difference between the estimate and a figure which would have been obtained from a complete census is less than the sampling variability." For any one cell the chances then are only one in 20 that the cell is significantly in error. In a table which contains a large number of cells, however, or in a time series in which we have one observation repeated for a number of months, it is more likely that some of the estimates will have sampling variability greater than the variability as calculated by Census. We do not know which cells might have these errors; we only know that the chances are less than 19 in 20 that all of them are within the designated sampling variability.

The question is, then, how much reliance can be placed on the findings based on such data. The answer, of course, is entirely a function of the nature and purpose of the analysis. Some of the cells in any given table very probably have a minimum of error; others may have a maximum of error when the intentions of the analysis are considered. For example, if one is interested in the question of new entries into the labor force by occupation – which takes place among the youngest age groups in which the numbers are quite small – or if one is interested in withdrawals from the labor force by occupation which also occur in the relatively small cells, then one is not quite certain of the reliability of his analysis.

How much effect the revised sampling scheme will have is unknown to the writer. All he can say is that he hopes the variability will be small enough so that a table such as that illustrated here will be interpretable other than in the purely negative sense. It is always possible to conclude that a difference, or change, is smaller than the sampling variability and thus arrive at negative conclusions, but one does not conduct investigations to arrive only at such negative findings.

What can be done? Not being an expert at sampling, I do not have any specific proposals to make regarding how the sample ought to be redesigned, nor any opinions about the most recent changes alluded to above. All that can be emphasized is that the Current Population Survey sample should be designed to serve the analytical needs rather than making the analytical needs subservient to the techniques of survey taking.

Certainly, if money were no objective, the sample could be redesigned to provide all of us with the most detailed information we may ever want. Unlimited funds, obviously, are not available. On the other hand, I firmly believe that the amount of money being spent to collect labor force statistics should be increased substantially. Knowledge about the American people is more important than knowledge about American pigs or cows, in my opinion at least. However, on the assumption that no significant increases in funds will become available in the near future, it becomes pertinent to consider all means of redesigning the sample so as to obtain more detailed information for substantially the same budget.

One suggestion which may have relevance is that if sampling variability can be reduced considerably and the number of cross-tabulations increased – all within the same budget – by giving up the monthly feature for either a bi-monthly or quarterly report, such would be satisfactory to me. If there are certain costs in a monthly report which can be saved by shifting to a less frequent survey, then, presumably, such savings can be expended on further improvements in the survey design. These improvements, in turn, would make the Current Population Survey even more useful to the analyst. If, however, no savings are possible by giving up the monthly feature, or if the savings are not spent on further improving the survey, then I am not willing to give up the monthly feature. As one consumer of the statistics, I am interested primarily in having more and better data and am quite content to have the sampling experts select that method which will provide the best statistics possible. Furthermore, as a taxpayer, I am willing to pay additional taxes in order to have such improved statistics.

Estimating Daily Order Receipts From Weight of Mail

By C. W. SMALLEY
Sears Roebuck and Co.

In the operations of a Mail Order Plant it is highly desirable to know as early as possible each day, what the volume of that day's orders will be. This must not only be determined promptly but also with considerable accuracy. Sears, Roebuck and Co. do this by weighing the early morning mail, and by 8:30 each morning they have predicted the number of orders that will be received that day and made the necessary plans for their handling.

All large Mail Order Companies use very similar operating procedures. Orders are handled in a 10-15 or 20 minute cycle, and the volume handled in that cycle can range from 1000 to 4000 (depending upon the size of the plant and the season of the year).

This means that from 1000 to 4000 orders are being processed, assembled, packed and shipped through the same operational channels and personnel during each cycle of approximately 15 minutes. Since any overlapping of these cycles means chaos, it is understandable that early and accurate order estimates are essentional for the daily planning.

Sears, Roebuck and Co., of course, prepares long range estimates covering each of the Spring-Summer and Fall-Winter Seasons. These estimates are reviewed and revised, if necessary, at the beginning of each of Sear's thirteen yearly periods. But the daily estimates are the final word and on these Sears base their daily operating plans.

No one is quite sure just when the weighing of the mail became the basis for estimating. Certainly it started a long time ago and over the period of many years Sears has accumulated a vast store of knowledge as to how many orders can be expected from each pound of mail – and as a matter of fact, they also know what else that pound of mail will contain. How many requests for their current catalog –how many payments on accounts–how many complaints from customers – and so on.

The Sears Philadelphia Plant makes the first pick-up of mail from the postoffice at 4:30 a.m. and unless trains have been delayed by unusual conditions, this will be the heaviest single pick-up of mail for the day. Five additional mail pick-ups will be made that day ending at 3:00 p.m. All mail receipts are carefully weighed and recorded but only those mails received prior to 8:00 a.m. are used for estimating the day's receipts.

When the mail reaches the Mail Order Plant it is trucked to the Mail Opening Division where it is weighed in the mail sacks and the gross weight recorded. Next, the mail sacks are emptied in specially designed compartments and small first-class mail packages, and slugs are sorted out. "Slugs" is the postal name for the large, bulky business envelopes containing reports, statistical data, and business records received by the Mail Order Plant daily from all of it's Retail Stores and Sales Offices. The weight of the packages, slugs, and mail sacks is now determined and subtracted from the gross weight to secure the actual net weight of customer mail.

Each mail sack carries a "Sack Tag" that shows the origin of the mail it contains. If the mail from any particular train or area is missing it is easily detected and the poundage of mail is adjusted for comparative purposes.

Based on their past experience, the poundage of mail received by 8:00 a.m. tells Sears the total pounds of mail that they will receive that day.

There is no complicated formula involved in translating pounds of mail into number of orders. Past records show that, during normal times, each pound of mail will produce from 30 to 37 cash orders, 2 time payment orders, and 3 C.O.D. orders. Since the average pound of mail contains 60 envelopes, the remainder will be payments on accounts, catalog requests, and miscellaneous correspondence.

Monday's mail contains fewer orders per pound than any other day of the week – and Tuesday's mail contains the most. Sears use the term "Quality of Mail" when referring to the number of orders per pound; thus Monday is a low quality day and Tuesday is a high quality day. During a normal week the "Mail Quality" will run as follows:

Monday – 30 Cash Orders Per Pound of Mail
Tuesday – 37 Cash Orders Per Pound of Mail
Wednesday – 35 Cash Orders Per Pound of Mail
Thusrday – 32 Cash Orders Per Pound of Mail
Friday – 31 Cash Orders Per Pound of Mail

Immediately following the mailing of a new catalog

and during the Christmas Season, the "Quality" of the mail improves and more orders per pound can be anticipated. The recency of a catalog release is a factor that Sears must keep in mind when estimating their order receipts. Mail "Quality" standards for these periods are well established and are applied to the poundage at the proper times.

Estimating order receipts from the weight of the mail is a simple practical method; with a minimum expenditure of effort and time.

The accuracy of this method is demonstrated by Sears records for 1953 to date – the daily estimates have varied from the actual receipts by about one-half of one percent.

NEW SECTION ON SOCIAL STATISTICS

Former Committee on Statistics in the Social Sciences Granted Charter by Board of Directors

The following officers were elected at the first annual meeting of the Social Statistics Section on December 30, 1953:

Chairman: Edward B. Olds, Adult Education Association of the U. S., Washington, D. C.

Chairman-Elect: Seymour L. Wolfbein, Bureau of Labor Statistics, Washington, D. C.

Vice-Chairmen: Nathan Goldfarb, Health Insurance Plan of Greater New York;
Eli S. Marks, National Opinion Research Center, Chicago.

Secretary: A. J. Jaffe, Bureau of Applied Social Research, Columbia University, New York City.

ASA members who are interested in the Social Statistics Section are encouraged to:

1. Check the appropriate box on the membership directory card which is being sent out by the ASA;
2. Submit your suggestions on desirable activities for the Section to any of the officers, or to the Social Statistics Section, ASA, 1108 16th Street, N.W., Washington 6, D. C.;
3. Participate in the meeting to be held at Montreal to discuss reports on recommended activities.

The Charter of the Social Statistics Section, which was approved by the Board of Directors, is reproduced below.

Charter of the Social Statistics Section of the American Statistical Assocciation

Organization

Membership in the Section shall include all members of the American Statistical Association who indicate to the Secretary of the Association an interest in the activities of the Section.

The annual meeting of the Section shall be held in connection with the annual meeting of the American Statistical Association and shall be announced in advance, preferably in the printed program of that meeting.

The officers of the Section shall consist of a Chairman, Chairman-elect, Vice Chairmen, and Secretary. The Chairman shall represent the Section on the Council. The second representative of the Section on the Council shall be the Chairman-elect. The term of office shall be for one year and until newly elected officers have been qualified. No member shall be eligible for re-election to the same office for more than two consecutive years. Election shall be by majority vote of members of the Section present at the annual meeting, or by mail ballot, subject to the approval of procedures by the Board of Directors of the Association. The management of the affairs of the Section between annual meetings shall be entrusted to a Section Committee composed of the officers. The Section, or the Section Committee, may establish such subcommittees as they wish to carry out the functions of the Section.

Scope

The special interests of the Social Statistics Section will include:

a. The fields of (1) anthropology, demography, political science, social psychology (including public opinion and attitude research), and sociology; (2) public and private social services, including criminology and penology, education, housing, public health, and social security; and other related fields.
b. Statistical analysis of the relations between various social, economic, and other pertinent factors.
c. Criticism and reformulation of stated generaliza-

tions and principles in the light of statistical analysis.

d. Interpretation of social statistics in the light of underlying statistical procedures and related principles.

e. The planning, design, and execution of studies to measure needs for various social services and the benefits and effects of various programs.

f. Techniques of estimation, projection, and forecasting.

g. Methods of presentation of social statistics.

Functions

The functions of the Social Statistics Section of the American Statistical Association are: (a) The advancement of research in social statistics, both in areas which involve use of methods of statistical inquiry and those which involve the use of statistical data and the development of statistical measurement, and (b) to plan for active participation in the affairs of the Association by those interested in these matters and for representation of activities in this major field in the program of the Association. Specific activities under this general function will be—

a. To plan, in cooperation with the general program committee, appropriate sessions on social statistics at the annual meeting of the Association.

b. To stimulate the preparation of articles dealing with social statistics for publication under Association auspices.

c. To foster the preparation and improvement of the quality of statistical data and statistical techniques valuable in the analysis of social data or in the formulation of social policies.

d. To advance knowledge by the use of statistical facts and methods.

e. To aid, by whatever special ways, possible within the group, general development of the American Statistical Association including expansion of membership, financial assistance, etc.

f. To produce separate publications either as monographs or periodic bulletins or journals as may be needed, with the approval of the Council.

Amendments

This Charter may be amended by the Section with the approval of the Board of Directors.

WANTED

Back issues of the **Journal of The American Statistical Association.** The national office of ASA needs copies of the following issues:

VOLUME 36, No. 213, MARCH, 1941

VOLUME 42, No. 238, JUNE, 1947

VOLUME 42, No. 239, SEPTEMBER, 1947

VOLUME 48, No. 261, MARCH, 1953

VOLUME 48, No. 262, JUNE, 1953

Please forward your copies direct to the Secretary's office, 1108 16th Street, N.W., Washington 6, D. C.

THE FUTURE ANNUAL MEETINGS OF THE ASSOCIATION WILL BE HELD AS FOLLOWS:

	Headquarters	Dates
1954—Montreal, Canada	Hotel Mt. Royal	September 10-13, 1954
1954—Regional Meeting, San Francisco	(This will be held in December. Final dates and hotel have not yet been chosen.)	
1955—New York City	Hotel Biltmore	December 27-29, 1955

ELECTION OF NEW FELLOWS

Report of 1953 Committee on Fellows

At the Annual meeting of the Association in Washington, D. C., on December 28, 1953, the Committee on Fellows elected the following persons as Fellows of the American Statistical Association.

MAURICE BELZ, Professor of Mathematics, University of Melbourne, teacher and contributor to statistical theory in economics, in industrial production, and in social and economic surveys; a teacher and expositor of renown.

ENRIQUE BLANCO LASOILIER, Madrid; teacher and research worker, who has contributed statistical theory and practice toward improved statistical surveys and to achieve increased output and improved quality and uniformity in the industry of Spain.

ALBERT H. BOWKER, Professor of Mathematical Statistics, Stanford University, whose original researches in statistical theory have brought world-wide recognition, and whose superb ability in teaching and in organization for teaching have made his department an enviable model.

K. A. BROWNLEE, Dept. of Statistics, University of Chicago, whose workings and services as a consultant have done much to stimulate the fruitful application of factorial design in industrial research and development.

SELWYN D. COLLINS, Chief of the Morbidity and Health Statistics Branch in the Public Health Service, known for his many studies of the distribution of illness in the population, and for his mastery in the collection and analysis of morbidity data.

TORE DALENIUS, Stockholm, research worker and expositor of statistical theory whose theories have improved the efficiency of statistical survey in all parts of the world, and whose tireless devotion has raised statistical standards throughout Europe.

JOSEPH F. DALY, Bureau of the Census, whose original researches in mathematical statistics and in the application thereof, and whose superb ability as a teacher have helped to raise the efficiency and reliability of statistical surveys in all parts of the world; noted also for his applications of theory to industrial production.

KINGSLEY DAVIS, Bureau of Applied Social Research, outstanding sociologist and demographer whose penetrating statistical analyses have added much to our knowledge of industrially undeveloped regions, particularly India and Pakistan.

M. A. TEIXEIRA DE FREITAS (retired December 19, 1952 from his position as Director of Statistical Service for the Ministry of Education and Health of Brazil), for his pioneer work in the organizing of the statistical work of Brazil and for making outstanding contributions to the improvement of professional work in this field in not only his own country but in other countries of the Western Hemisphere.

J. EDWARD ELY, Chief, Foreign Trade Division, Bureau of the Census, for bringing about major improvements in the nation's foreign trade statistics compiled under his direction and for effective support of the movement for improving international comparability.

ERNEST M. FISHER, Director, Institute for Urban Land Use and Housing Studies, Columbia University, for his outstanding achievements in improving the supply and quality of housing statistics in the United States and his effective cooperation with business groups, and in particular for his successful efforts in obtaining approval for the first Census of Housing.

LESTER R. FRANKEL, Alfred Politz Research, pioneer contributor to the theory and practice of modern sample-design in surveys of the labor force, and of population and housing; who more lately has successfully demonstrated the advantages of sound statistical surveys in the field of marketing research; teacher and expositor of renown.

RAYMOND W. GOLDSMITH, Study Director, National Bureau of Economic Research, for his many contributions in filling many gaps in our statistics relating to wealth and investment, and for his major efforts in developing estimates of savings in various economic fields and over long periods of time.

BOYD HARSHBARGER, Virginia Polytechnic Institute, Blacksburg, whose tireless efforts in the face of unusual difficulties have built an institution of renown for the study of the design of experiment and of other statistical techniques; teacher; producer of original research.

H. O. HARTLEY, University College and the Iowa State College, a discoverer of new and useful statistical techniques and an authority on the construction of statistical tables.

WALTER E. HOADLEY, JR., Economist, Armstrong Cork Company, for his effectiveness in extending the ap-

plications of statistics to many types of business problems and for the strong leadership which he gave to the Section on Business and Economic Statistics.

HANS KELLERER, Professor of Statistics at the Free University of Berlin, leader in Germany of improved statistical surveys; cofounder and coeditor of the *Mitteilungsblatt fuer Mathematische Statistik*, Muenchen; research worker in statistical theory.

ARNOLD J. KING, President of National Analysts, Philadelphia, research worker of long and distinguished standing in sample-designs for data on agriculture, population and marketing; who has successfully demonstrated the advantages of sound statistical surveys in the field of marketing research.

DUDLEY KIRK, Department of State, distinguished demographer and sociologist, whose statistical investigations of Europe's population have added much to our knowledge of the processes of population change.

E. F. LINDQUIST, College of Education, State University of Iowa, known from his books as a pioneer in the introduction of sound methods into experimentation in education.

GLENN E. MCLAUGHLIN, Economist, Export-Import Bank, for notable contributions to the analysis of the factors connected with the changing distribution and structure of American industry as well as for his valuable services as Review Editor of the Journal of the American Statistical Association for a number of years.

SENORITA CARMEN MIRO, Director of the National Bureau of Statistics and Census, Republic of Panama; Professor of Statistics, National University of Panama; who distinguished herself for her many contributions to the greater effectiveness of the recent Censuses of the Americas; who created a comprehensive and useful statistical system for her country.

HARRY G. ROMIG, Hughes Aircraft Co., who for three decades has worked in statistical theory that was needed in problems of industrial production; whose work has increased industrial production and improved quality and uniformity of manufactured products in all parts of the world; a leader in expository meetings for the study of statistical theory and its practice.

WILLIAM R. THOMPSON, Senior Biochemist, New York State Dept. of Health, whose highly original contributions to important problems in biometry have brought recognition, and stimulation to the research of others.

ALFRED N. WATSON, Executive Vice President, Wesleyan University Press, for pioneering in the application of population and housing census statistics to the description of the characteristics of magazine subscribers and for his outstanding service as Chairman of the 1952 Program Committee.

A. E. R. WESTMAN, Ontario Research Foundation, Toronto, expositor and tireless contributor for three decades to statistical theory applied to process regulation and to the testing of industrial materials; whose work has increased industrial production and has improved the quality and uniformity of manufactured products in all parts of the world.

RALPH A. YOUNG, Director, Division of Research and Statistics, Board of Governors of Federal Reserve System, whose stimulating guidance of the research program of the Federal Reserve System is based upon extremely broad experience in the analysis and interpretation of banking and other financial statistics.

LIMITS OF MATHEMATICS IN STATISTICS—CONTINUED FROM PAGE 10

world, we discover that like all living things they defy precise measurement. And yet we continue to count, measure, and weigh them because without quantitative analysis we cannot understand and appraise them. Mathematical devices are necessary in this work but the mathematical laws which control the Euclidian Universe cannot be extended to human relations. Their quantitative analysis requires more than mathematical skill and familiarity with the field from which the data come. It requires imagination and intuition. Such an analysis is an art more than a science.

Mathematical training is essential for a statistician. It serves three purposes: it puts the tools of quantitative analysis at his disposal; it enables him to choose those tools which best fit the material with which he works; and it reveals to him the difference between the mathematical and statistical worlds — the difference which sets the limits of mathematics in statistics and accounts for the limitation of statistics as mathematical values.

This does not solve the controversy in the concept of statistics. My intention has been not to solve but to stress the controversy. I feel that in the broad realm of human knowledge there is room for two disciplines which have the same name: *statistics* as a branch of applied mathematics; and *social and economic statistics* as the art and science of quantitative thinking on human affairs.

NEWS ABOUT MEMBERS

B **Kurt W. Back** is now employed as a Research Associate in the Social Science Research Center, University of Puerto Rico, on the Family Life Project. He is also a consultant on Social Research to the Model Housing Board of the Puerto Rican Housing Authority, and is acting as Puerto Rican affiliate of International Public Opinion Research, Inc., New York City.

Geoffrey Beall has been appointed head of the newly-created Department of Statistics at the University of Connecticut.

Paul M. Blunk is employed as an Operations Analyst with the Consolidated Vultee Aircraft Corporation in Fort Worth, Texas.

Joe N. Boyd formerly with the Bureau of Labor Statistics, has transferred to the U. S. Navy Mine Counter-Measures Station, Panama City, Florida.

C **Henry Caulfield** has been named staff assistant to the seven-man team which will study the organizational set-up and operating procedures of the Bureau of Mines, U. S. Department of the Interior.

L. S. Churchill has left the University of Louisville and is now employed by the Bell Telephone Laboratories, Inc. at Whippany, New Jersey, as a member of the technical staff.

Dorothy S. Cooke, formerly training officer at the Office of the Coordinator of International Statistics, Bureau of the Census, has left government service and is now employed as a statistician by the Ordnance Engineering Corporation.

Howard A. Cutler has been promoted to Associate Professor of Economics and head of the Department of Economics at Pennsylvania State College.

D **Eugene L. Davis** is now employed as Budget Analyst (Office of the Comptroller), for Headquarters Fifth Army Area, Chicago, Illinois.

Samuel J. Dennis, formerly with the Foreign Operations Administration, has accepted a Point IV assignment with the Census Bureau as a statistical adviser to the Government of Pakistan.

E **Daniel Embody** is now employed as a Biometrician in the Division of Analytical and Physical Chemistry of the Squibb Institute for Medical Research, New Brunswick, New Jersey.

F **Jefferson Feagin** has transferred to the Executive Branch of the Field Service Division of the Office of the Chief of Ordnance. He is working in the management improvement field on a special project to install financial property accounting throughout the country.

G **William E. Gibbons** is now Chief, Quality Control Branch, N. P. D. Redstone Arsenal, Huntsville, Alabama.

Raymond Gillespie is now employed by the Metals Research Laboratories of the Electro Metallurgical Company, Niagara Falls, New York, as a Senior Research Assistant.

Ezra Glaser has rejoined the regular staff of the Office of Statistical Standards, Bureau of the Budget. He was formerly with the Inter-Industry Economics Research staff, which was terminated on November 30th.

Leo A. Goodman formerly Assistant Professor of Statistics and Sociology at the University of Chicago, has been promoted to Associate Professor. He will be on a leave of absence for the academic year 1953-54, and will be working at Cambridge University, Faculty of Mathematics, Statistical Laboratory, St. Andrew's Hill, Cambridge, England, as an Advanced Research Scholar in receipt of a Fulbright Award, and as an Honorary Research Training Fellow of the Social Science Research Council.

H **Bertram W. Haines** is studying for the degree of Doctor of Science at the Biostatistics Department of the School of Hygiene and Public Health of Johns Hopkins University at Baltimore.

Richard W. Havens has been elected president and chief executive officer of the Jenkintown Bank and Trust Company, one of the largest suburban Philadelphia banks. He was formerly staff economist and financial adviser with the Electric Storage Battery Company.

Norman F. Heydinger has been appointed Assistant Manager of the Sales Statistical Department, Seiberling Rubber Company, Akron, Ohio.

Ernest Klepetar, Actuary with the Mutual Service Life Insurance Company, St. Paul, has been appointed Research Associate in Actuarial Science by the University of Minnesota. Mr. Klepetar received this honorary title because of his research work with Dr. Ancel Keys of the University Laboratory of Physiological Hygiene on the incidence, mortality, and possible prevention of degenerative heart disease. Mr. Klepetar and Dr. Keys will continue this research work with headquarters in Naples, Italy for the next few months.

Mitchell Kolsan has resigned as statistician in the Budgets and Analysis Section of the Cleveland Tank Plant of the Cadillac Division of the General Motors Corporation. He is now the statistician for the Central Market Research Bureau of the Electric Storage Battery Company.

L **Herbert Levitt** is now an Economic Analyst with the Port of New York Authority.

Clem C. Linnenberg, Jr., formerly in the U. S. Department of Commerce, is now a Transportation Economist in the Federal Supply Service, General Services Administration, Washington, D. C.

Eugene Lukacs has transferred from the National Bureau of Standards to the Office of Naval Research, where he is serving as head of the Statistics Branch.

Wendell Macdonald, Regional Director of the Boston Office of the Bureau of Labor Statistics, has joined the European Productivity Measurement Team as its leader.

Jack F. Miller is now Assistant Budget and Accounting Officer at Travis Air Force Base and is in charge of the Expense Accounting Section.

O. B. Moan is Staff Quality Control Engineer on the Director of Quality Control's Staff at Hughes Aircraft Company, Culver City, California.

James C. Munch has returned to consultant practice, dealing especially with applications of statistical procedures to bioassay and pharmacological studies on new drugs.

Charles B. Nam has joined the Manpower Division of the Human Resources Research Institute, Maxwell Air Force Base, Alabama. He was formerly with the Population and Housing Division of the Bureau of the Census.

Edward B. Olds is now directing a study on the "Financing of Adult Education" for the Adult Education Association of the U.S.A. in Washington, D. C. The report on a study of "Young People and Citizenship," which he directed for the National Social Welfare Assembly in New York, has just been published.

George E. Phillips, formerly with the Bureau of Labor Statistics, is now employed as a supervisory statistician in ammunition procurement, Department of the Army, Ordnance Ammunition Center, Joliet, Illinois.

Alan L. Price has left the U. S. Department of Labor and is now with the "Ansco" Division of General Aniline and Film Corporation, New York City.

Isabel R. Reidle, formerly statistician for the Wisconsin State Selective Service Headquarters, is now analyst for Hall Brothers, Inc., of Kansas City, Missouri, manufacturers of Hallmark Greeting Cards.

Walter Romm, formerly with the Logistical Analysis Branch, Surgeon General's Office, Brooklyn, New York, has accepted an appointment as Analytical Statistician (Health and Medicine) in the Administrative Office, Medical Division, Veterans Administration, New York. He will conduct and correlate the statistical program of the Medical Division as it relates to the operational, administrative and professional functions of the division.

Harry A. Shoemaker received his Ph.D. in Psychology from the University of Colorado in August, specializing in experimental psychology statistics and learning theory. He is now working for the Human Resources Research Office, George Washington University, Washington, D. C.

Jacob S. Siegel, since 1949 Chief, Estimates and Forecasts Unit, Demographic Statistics Section, Poulation and Housing Division, U. S. Bureau of the Census, is currently associated with the International Population Statistics Section of the Population and Housing Division.

Monroe G. Sirken, formerly with the Response Research Unit in the Office of the Assistant Director for Statistical Standards at the Bureau of the Census, has been appointed as Chief of the Actuarial Analysis Branch in the National Office of Vital Statistics.

E. H. Sonnecken, formerly Manager of Tubeless Tire sales for the B. F. Goodrich Company, Akron, Ohio, is now Manager of Consumer Research and Market Planning for the Ford Division, Ford Motor Company, Detroit, Michigan.

Robert B. Steffes, formerly with the Inter-Industry Economics Research staff, has rejoined the regular staff of the Office of Statistical Standards, U. S. Bureau of the Budget.

Herman N. Sturm, formerly Chief of the Technological Developments Branch, Productivity Division, Bureau of Labor Statistics, is now Director of the Productivity Measurement Institute, Washington, D. C., a private consultant organization.

E. S. Weiss, after three years assignment as Chief, Epidemiology and Biometry Branch at the Arctic Health Center in Anchorage, Alaska, has been transferred to Cincinnati, Ohio, to serve as statistician at the Field Headquarters of the Division of Occupational Health of the U. S. Public Health Service.

Samuel Weiss, Executive Director of the American Statistical Association, has been in Puerto Rico for three weeks as adviser to the Secretary of Labor of the Commonwealth of Puerto Rico on statistical matters.

C. W. Whitston is now President of Neoline, Inc., Glendale, California. He is also still acting as a management engineer or management consultant.

Robert M. Woodbury has retired as Chief Statistician and Chief of the Statistical Division of the International Labor Office, Geneva, Switzerland, and is now living at Bryn Mawr, Pennsylvania.

CHAPTER NOTES

ALBANY

A joint dinner meeting with the Albany Section of the American Society for Quality Control was held on November 10th at which Professor Lee S. Crump, Chief Statistician with A.E.C. Operations at the University of Rochester, discussed "Design of Experiments". The meeting was preceded by a clinic on a problem of quality control. At the meeting of December 10th, Dr. Robert F. Korns, Director of the Bureau of Epidemiology and Communicable Disease Control, New York State Department of Health, spoke on the subject, "Can Polio Be Prevented?", dealing with the evidence and the problems involved in trying to determine whether gamma globulin and polio vaccine work.

BOSTON

At the meeting held on December 8th, Wroe Alderson, partner in the management consultant firm of Alderson and Sessions and visiting professor in the School of Industrial Management of M.I.T., spoke on "An Operations Research Approach to Consumer Shopping". Mr. Alderson explained the application of Operations Research to the problem of predicting consumer reactions, indicating the likelihood that shopping practices follow a probability distribution for which parameters may be determined through specialized interviewing techniques. In addition to chapter members, the audience included members of the American Marketing Association and other invited guests.

CENTRAL NEW JERSEY

The speaker at the meeting held on December 14th was Walter E. Gude, Supervising Staff Statistician of the New Jersey Bell Telephone Co. Mr. Gude's subject was "The Practical Uses of Statistics in the Telephone Business".

CHICAGO

At the luncheon meeting of November 5th, Professor Anatol Rapoport, Secretary of the Committee on Mathematical Biology of the University of Chicago, spoke on the subject, "New Technique for Predicting Mass Behavior". The speaker at the Nov. 19th luncheon meeting was Everette B. Harris, President of the Chicago Mercantile Exchange, who discussed "Profit Possibilities in Commodity Speculation". A joint luncheon meeting with the Chicago Chapter of the American Marketing Association was held on December 3. Dr. Hans Zeisel, a research consultant who is currently working on a Ford Foundation project at the University of Chicago Law School, discussed the techniques involved in analyzing multiple causation in automobile accidents.

The December dinner meeting heard Stanley H. Ruttenberg, Director of the Department of Research and Education of the C. I. O., speak on "Using Statistics to Build Labor's Case". At the luncheon meeting held on December 17th, M. Dutton Morehouse, Chicago Manager of Brown Brothers, Harriman & Co., discussed "The Effect of Consumer Credit on the Business Cycle".

CLEVELAND

Four luncheon meetings and a dinner meeting held jointly with the Cleveland Section of the American Society for Quality Control were held in 1953 following the election of officers last spring. Dr. Arthur Mace spoke on "Statistical Applications in Sales Forecasting"; Mr. A. W. Swan from England on "Industrial Statistics"; Mr. John Enos on "Techniques and Trends in Econometrics"; Dr. Arthur S. Littell on "Some Statistical Applications in Medical Research" and Dr. M. E. Wescott on "The 6 'C's' in Simple Correlation".

In addition, the Business Statistics Section of the Chapter held their annual forecast meeting in October and heard David C. Elliott, Economist of the Cleveland Trust Company, on "Functions of an Economics Department in a Commercial Bank" in December.

DENVER

The Chapter opened its 1953-54 season with a dinner on Oct. 22nd, at which Professor F. L. Carmichael, Director of the Bureau of Business and Social Research of the University of Denver and a charter member of the Denver Chapter, spoke on "Statistical Work as a Profession: A Critical Appraisal". Professor Carmichael suggested a thorough self-examination as to whether we really deserve the professional recognition we sometimes feel is warranted. He referred to the necessary qualities for constructive work as objectivity, integrity, intellectual honesty and freedom from bias.

On Nov. 17th the first of a series of seminar meetings for the year was held at the local offices of the International Business Machines Corporation on the subject, "Developments in the Field of Electronic Devices" Following a brief consideration of the history of computing machines and a trip through the I.B.M. Service Bureau, the technicolor film, "Piercing the Unknown", which deals with the new 701 electronic computer, was shown.

The Chapter's program for the coming year is geared to the central theme—"Toward the Advancement of Professionalism in the Field of Statistics". A dinner meeting will be held every other month, with a seminar in the interim months. The Chapter has started a monthly news letter, and has already made substantial progress toward its goal of 100 members by June.

DETROIT

The Detroit Area Chapter held a dinner meeting at Ann Arbor on Nov. 18th at which Dr. Lawrence Klein spoke on "An Econometric Forecast for 1954".

The following officers have been elected for the 1953-54 year:

President—Dr. Charles A. Metzner, School of Public Health, University of Michigan.

Vice - President — Stanley Roe, Automobile Manufacturers' Association, Detroit, Michigan.

Secretary-Treasurer — Dr. John Sagan, Ford Motor Company, Dearborn, Michigan.

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HAWAII

A joint luncheon meeting with the Aeronautical Affairs Committee of the Honolulu Chamber of Commerce was held on Nov. 13th at which Ralph Cohen, public relations director of the International Air Transport Association discussed "International Air Lines Rate Determination". At the December 17th meeting, Mr. John Child, Director of John Child and Co., an organization specializing in marketing research and land economics, spoke on "The Integration Factor of a Tourist Industry".

At the December meeting, the following officers for 1954 were elected:

President.....Fred Colland
1st Vice-President..Dr. Albert Tester
2nd Vice-President.....Frederick Loo
Secretary-Treasurer..Elizabeth Norton

Robert Schmitt will continue to serve as editor of the "News Letter", a medium for chapter news and technical research articles by chapter members.

UNIVERSITY OF ILLINOIS

At the meeting last May, Colin Blyth was elected president, F. G. Cornell president-elect, and L. C. Sartorius secretary. As Mr. Sartorius left shortly after, his place as secretary has been filled by the election of V. I. West.

LOS ANGELES

A joint dinner meeting was held on Dec. 2nd with the Los Angeles Section of the American Society for Quality Control. The topic was "Use of Statistical Methods in Electronics", and the speaker was Leon Bass, Supervisor of Quality Control, Electronics Division, General Electric Co., Syracuse, N. Y., and national treasurer of the American Society for Quality Control.

MILWAUKEE

At the first dinner meeting of the newly-founded Milwaukee Chapter held at Marquette University on Nov. 9th, Professor William Kruskal of the University of Chicago spoke on the "Non-Parametric Answer to the Problem of Non-Normality". Professor Kruskal discussed the basic ideas of statistical analysis by methods of ordered statistics and testing of hypothesis by non-parametric approach. The very successful evening was closed with a discussion about several interesting methods which he had introduced.

NEW YORK

The meeting on Nov. 19th heard Professor Herbert Robbins of the Department of Mathematical Statistics, Columbia University, speak on "Dangers Involved in Large Samples". At the meeting in December 4, Carl Erhardt of the New York City Department of Health and Marta Fraenkel of the Department of Hospitals discussed "The Hospital Morbidity Reporting Project in New York City—Experiences and Findings to Date".

The outlook for Federal taxation was the subject of the Dec. 9th meeting. Norris Johnson, Assistant Vice President of the National City Bank, spoke on "Federal Taxation and the Federal Budget," and Chester M. Edelman, Treasurer of the H. L. Green Co., discussed "Federal Taxation and the Business Outlook."

PHILADELPHIA

Professor William G. Cochran, President of the American Statistical Association, was the guest speaker at the opening dinner meeting of the Chapter on Nov. 13th. His topic was "The Application of Statistical Methods to Problems of Human Behavior".

ST. LOUIS

At the luncheon meeting on December 14, Roy Wenzlick, real estate economist; Werner J. Hirsch, Assistant Professor of Economics at Washington University; and Paul Young, Comptroller of Scruggs-Vandervoort-Barney, discussed the prospects for business activity in 1954. The dinner meeting on Dec. 14th heard Ewan Clague, U. S. Commissioner of Labor Statistics, speak on "Measurement of Labor Productivity".

Roy Wenzlick resigned his position as President of the St. Louis Chapter at the end of the year, and was succeeded by the Vice-President, William H. Kester. At the November meeting Werner J. Hirsh was elected as the new Vice-President, and George S. Little was elected Treasurer.

WASHINGTON

The November 16th meeting heard Henry Shryock, Assistant Chief of the Population and Housing Division of the Bureau of the Census, speak on "The Problem of Population Forecasts in the United States". Harold Dorn, National Institute of Health; Robert Myers, Chief Actuary of the Social Security Administration; Irving Siegel, Twentieth Century Fund; and Oris Wells, Administrator of the Agricultural Marketing Service, were commentators. The meeting on December 14th was devoted to "Operations Research"—the meaning and importance of developments in this field. Franz Alt, National Applied Mathematics Laboratories of the National Bureau of Standards, was chairman, and Joseph F. McCloskey, Operations Research Office of Johns Hopkins University, spoke on "The Concept of the Model in Operations Research". Discussants were Roger Crane, Melpar Corporation; Oscar Hoffman, Operations Evaluation Group of M. I. T.; and Bert Klein, Rand Corporation.